

IGBP/BAHC ProClim- AlpenForum Symposium
Thursday and Friday, 16 - 17 November 1995
University of Zurich, Irchel Campus, Zurich
The Role of the Hydrological Cycle in Mountain Ecosystems

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The Role of the Hydrological Cycle in Mountain Ecosystems

ProClim-

Forum for Climate and Global Change

Swiss Academy of Sciences

Bärenplatz 2

CH-3011 Bern, Switzerland

Tel. (41-31) 312 21 14

Fax. (41-31) 312 55 37

E-mail: proclim@sanw.unibe.ch

Symposium objectives

It is through the hydrological cycle that components which accumulate in the atmosphere over urban centers are transported over long distances and later deposited on remote mountain ecosystems. The naturally oligotrophic mountain ecosystems will thus experience changes which will only be noticed decades from today. The substances contained in the atmospheric water will chronically influence the metabolic and reproductive behavior of the terrestrial and the aquatic organisms and thus regulate the selection of the phenotypic diversity able to colonize mountain habitats and to adapt to the harsh living conditions of high altitude environments.

The alpine biosphere constitutes a thin layer between the atmosphere and the underlying lithosphere. Ecosystems within this layer are labile and sensitive toward climatic and anthropogenic alterations. In the course of the symposium we will summarize our knowledge about observed and predicted responses of the mountain biosphere toward qualitative and quantitative changes in the hydrological regime. We will identify gaps and formulate new research avenues.

The symposium shall serve to enhance our knowledge of (1) the dynamic interactions between atmospheric, hydrospheric and biospheric compartments in mountain environments, (2) possible reactions of the mountain biosphere and the pedosphere toward changes of the hydrological cycle and (3) the sensitivity of mountain ecosystems to climate changes.

Honorary committee

Prof. Ch. Emmenegger, A. Musy, H. Oeschger and Dr. R. Weingartner

Directions to "Theatersaal", Irchel Campus: The Irchel Campus can be reached from the Zurich main train station by trams No. 10 (stop "Irchel") or Nos. 7 and 14 (stop "Milchbuck"). Follow the signs to the "Theatersaal" where the symposium will be held.

The Role of the Hydrological Cycle in Mountain Ecosystems

Thursday, 16 November 1995

0800 Registration begins

0915 Welcome

Ch. Emmenegger

Module 1 Atmosphere-hydrosphere interactions

Content: Quantities, sources, transport routes and reservoirs of water, pollutants and nutrients; their variability in space and time

Chair: A. Herrmann

0930 Seasonal and regional variation of precipitation and of snow cover in high altitudes

D. Grebner, H. Lang and M. Rohrer

1005 Water as a variable resource in alpine environments

B. Schädler

1040 Intermission

1100 Chemical interactions between atmospheric and hydrospheric compartments in mountain regions

H. Gägger

1135 Nutrient accumulation in snow and ice

M. Kuhn

1210 Scenarios for local meteorological conditions and events in mountain environments

D. Gyalistras and H. Wanner

1245 Lunch

Module 2 Hydrosphere-biosphere transfer

Content: Specification and quantification of pollutants and nutrients reaching alpine ecosystems

Chair: H. Lang

1415 Seasonal variations and trends of atmosphere-borne nutrient load to the alpine biosphere and pedosphere

R. Mosello, A. Barbieri, A. Marchetto

1450 Organochlorinated and polycyclic aromatic hydrocarbons in sediments and fishes of high altitude lakes

J.O. Grimalt

1525 Intermission

1550 Airborne dust: a major influence on the chemistry and biology of alpine lakes

R. Psenner

1625 Methods for the quantification of mass fluxes on the local and regional scale between the atmosphere and alpine soil and water surfaces

W. Graber

1815 Barbecue

Botanical Garden of the University, Zollikerstrasse 107, 8008 Zürich

Friday, 17 November 1995

Module 3 Biospheric responses

Content: Performance and physiological responses of organisms and alpine ecosystems to atmospheric and hydrological factors

Chair: J. Schneller

0830 Effects of variations in temperature and dryness on the reproduction and propagation of arctic / alpine plants

R.M.M. Crawford

0905 Response and adaptation of microbial communities in alpine lakes and ponds to changes in environmental conditions

K. Hanselmann, K. Mez, M. Baumgartner, D. Högl

0940 Intermission

1000 The response of fish in low electrolyte habitats toward environmental stress

B. O. Rosseland

1035 The role of vegetation and its evaporative potential in the climate-water system of mountain regions

R. Häsler

1110 Nitrogen saturation of alpine forest ecosystems: first results of the Swiss NITREX-Project at Alptal

J.B. Bucher and P. Schleppli

1145 Lunch

Module 4 Sensitivity of alpine environments to climatic changes

Content: The sensitivity of the hydrological cycle and of ecosystems in alpine environments to climatic change

Chair: U. Moser

1300 Using sediment records to infer the medium and long-term variability of alpine lake ecosystems

R.W. Battarbee

1335 Nitrogen and carbon soil dynamics in response to climate change in high-elevation ecosystems

M. W. Williams, T. Seasted, St. Schmidt

1410 Frost-induced runoff: a potential risk of global warming in a pine soil

H. Flüeler

1445 Intermission

1515 Forum: Research needs

Moderator: H. Oeschger

Participants: R.W. Battarbee, R.M.M. Crawford, M. Kuhn, A. Musy, R. Weingartner

1645 Outlook

A. Herrmann

1700 End of the symposium